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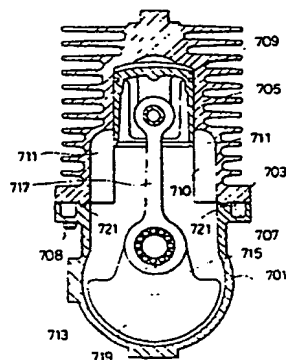
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(54) Portable engine unit.

(57) A portable engine unit is provided. The unit  
comprises an engine including a clutch, a crankcase  
enclosing a crank shaft, an engine cylinder enclosing  
a piston and a piston rod, a carburetor, an air filter, a  
recoil starter, and a muffler; and a housing for en-  
closing the engine, comprising at least two portions  
which are assembled and disassembled along a  
plane including the axis of rotation of an output shaft  
of the engine to enclose and expose the engine.

FIG.7



direction to the engine 1 side and guided by the guide plate 145 to flow around the cylinder 53.

The recoil starter 45 will now be described with reference to Figs. 5 and 6. The recoil starter 45 is arranged around the bearing portion 91 with a proper gap between them. The recoil starter 45 has on its periphery a fitting portion 147 which engages with the housing 3 as well as having on its inner side face projections 149 which engage with the crankcase 47 to prevent the rotation of recoil starter 45. A reel 151 of the recoil starter 45 is rotated against the spring force of a spiral spring 153 by pulling a starter handle (not shown) fixed to an end of a starter string 155 which is wound around the reel 151. A pivotable nail 157 is arranged on the inner surface of the magnet wheel 43 and pushed by a spring 159 against a ratchet 161 provided on the outer surface of the reel 151. The reel 151 and the spiral spring 153 may solidly be made by synthetic resin.

According to the above arrangement, if the starter handle (not shown) is pulled to pull the starter string 155, the reel 151 is rotated to engage the ratchet 161 with the nail portion 157 to rotate the magnet wheel 43. Accordingly, the crank shaft 21 which is fixed to the magnet wheel 43 is rotated to start the engine 1. After that, the nail portion 157 is pushed away by the ratchet 161 to release the engagement between them, and this released state is maintained due to the centrifugal force. If the speed of engine 1 is increased to a predetermined value, the centrifugal clutch 105 is engaged with the clutch drum 41 to transmit torque to the transmission shaft 7 via the vibration isolator joint 39. Since a gap is provided between the bearing portion 91 of crankcase 47 and the recoil starter 45, the heat and vibration of crankcase 47 is not transferred to the recoil starter 45.

Figures 7 to 9 show a structure of a fitting surface between a crankcase 701 and an engine cylinder 705. In the figure, a fitting surface 703 of the crankcase 701 is fixed to a flange surface 707 of the engine cylinder 705. A seal groove 721 is provided on the fitting surface 703 along inner contour thereof, and a projection 723 which engages with the seal groove 721 is formed on the flange surface 707. In assembling, a seal member 725 such as liquid packing is filled in the seal groove 721, and the projection 723 of the flange surface 707 is engaged therewith. After that, the engine cylinder 705 and the crankcase 701 are fixed tightly with bolts 708.

According to this constitution, the flange surface 707 and the fitting surface 703 are not required to be machined so that the manufacturing process may be reduced. Further, the bolts 708 will not be loosened due to the vibration of engine, because the flange surface 707 and the fitting

surface 703 contacts directly with each other without a gasket between them.

Figure 10 shows the arrangement of crank shaft. In the figure, a crank arm 805 is formed solidly at one end of a main shaft 803. The crank arm 805 is provided with a threaded hole 807 which is eccentric with respect to the main shaft 803 and extends in parallel therewith. A shoulder bolt 809 is screwed into the hole 807. One end of a piston rod 815 is connected to the stepped portion of the bolt 809 through a roller bearing 813. Washers 817 are disposed on both sides of the roller bearing 813. A balance weight 819 is formed solidly at one side of the crank arm 805 opposite to the threaded hole 807.

#### Claims

1. A portable engine unit comprising:
  - an engine (1) including a clutch a crankcase (701) enclosing a crank shaft (21), and an engine cylinder (705) having a piston and a piston rod, a carburettor, an air filter, a recoil starter and a muffler; and
  - a transmission shaft (7) rotated by said engine (1), wherein said crank case (701) and engine cylinder (705) each have an internal bore which bores are connected when the engine cylinder (705) is fitted to the crank case (701), and two exhaust ports are formed at opposite sides of the bores along the axial direction of the bores, and said crank case (701) and said engine cylinder (705) each have an end face, and a groove (721) is formed on the end face of said crank case (701) along a contour of the bore and exhaust ports, and a link-like projection (723) which is to be engaged with said groove (721) is formed on the end face of the engine cylinder (705), and sealing material (725) is filled in said groove (721), whereby said crank case (701) and said engine cylinder (705) being fixedly attached by the engagement of said projection (723) with said groove (721) after said sealing material (725) is filled in said groove (721).
2. A portable engine unit as claimed in claim 1, further comprising a housing (3) for enclosing said engine (1).
3. A portable engine unit as claimed in claims 1 or 2, further comprising a second means for attaching said engine cylinder (705) to said crank case (701).
4. A portable engine unit as claimed in claim 3, wherein said second means for attaching com-

prises a bolt (708).

5. A portable engine unit as claimed in claims 1 or 2, wherein the height of the link-like projection (723) is smaller than the depth of the groove (721). 5

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